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NOTE

Reports of Four Year Accelerated Occurrences of the 2004 Emergence of Periodical Cicadas, *Magicicada* Spp. (Hemiptera: Cicadidae) Brood X in Maryland, Virginia, and the District of Columbia

Areas of the mid-Atlantic region of the United States (Maryland, Virginia and the District of Columbia) experienced an unexpected sporadic emergence of periodical cicadas (*Magicicada* spp.) in 2000. Periodical cicada emergences in this area attract public attention due to their abundant numbers, with population densities approaching 1 million individuals per acre (Dybas and Davis 1962). Each regional *Magicicada* emergence in a specific year is designated as a brood. Broods have been differentiated by an assigned Roman numeral reflecting their order of emergence (Marlatt 1907). There are twelve known 17-year broods (I–X, XIII, and XIV) and three 13-year broods (XIX, XXII, and XXIII). Since Brood X is expected to emerge in 2004 in this same area, it is believed that the 2000 emergences were 4-year accelerations of Brood X. Other 4-year accelerations of Brood X in 2000 were reported from Ohio (Kritsky and Simon 1996), Indiana, and Illinois (Cooley, Richards, Marshall, personal communication).

In the past, Brood VI has been reported sporadically throughout the mid-Atlantic region. However, recent studies by Cooley and Marshall (personal communication) suggest that Brood VI occurs further west, in western portions of North and South Carolina, and northern Georgia. Because the 2000 mid-Atlantic emergence was outside the known area of Brood VI, researchers have theorized that this emergence was a 4-year acceleration of Brood X. If this hypothesis is true, then all the reports should be contained in the known range of Brood X.

Since 1996, the author has documented the presence or absence of periodical cicada broods (II, V, VIII, and IX) in the mid-Atlantic region both in the field and through reviewing historical records in the literature. To date, there has not been a single record of two different broods occurring in the same woodlot. No known populations of the four species of periodical cicadas (3 species of the 17-year cicada, *M. septendecim* (L.), *M. septendecula* Alexander and Moore, and *M. cassinii* (Fisher), and one species of the 13-year cicada, *M. tredecim* (Walsh and Riley), found in the mid-Atlantic region (Pennsylvania, West Virginia, Virginia, Maryland, District of Columbia, and Delaware) overlap. In fact, many contact areas where two different broods meet are characterized by a gap where no periodical cicadas are known to occur. Based on this information, it is the author's opinion that any populations that occur in off-years within a known well-established brood area are most likely accelerations or decelerations of that well-established brood and not a separate brood.

Brood X, in the mid-Atlantic, is found in northern Virginia, western and central Maryland, northern Delaware and southern Pennsylvania, as well as, the District of Columbia. During the unexpected 2000 emergence, reports of stragglers were solicited throughout the area. All the information obtained was organized by county and placed on a map of the known range of Brood X. Following is a list of the recorded populations that were reported to the author during May and June of 2000. All the sites reported in 2000 were within the historical boundaries of Brood X.

A total of 124 independent reports were obtained from the Maryland, Virginia, and District of Columbia area. Six were received from the District of Columbia, 90

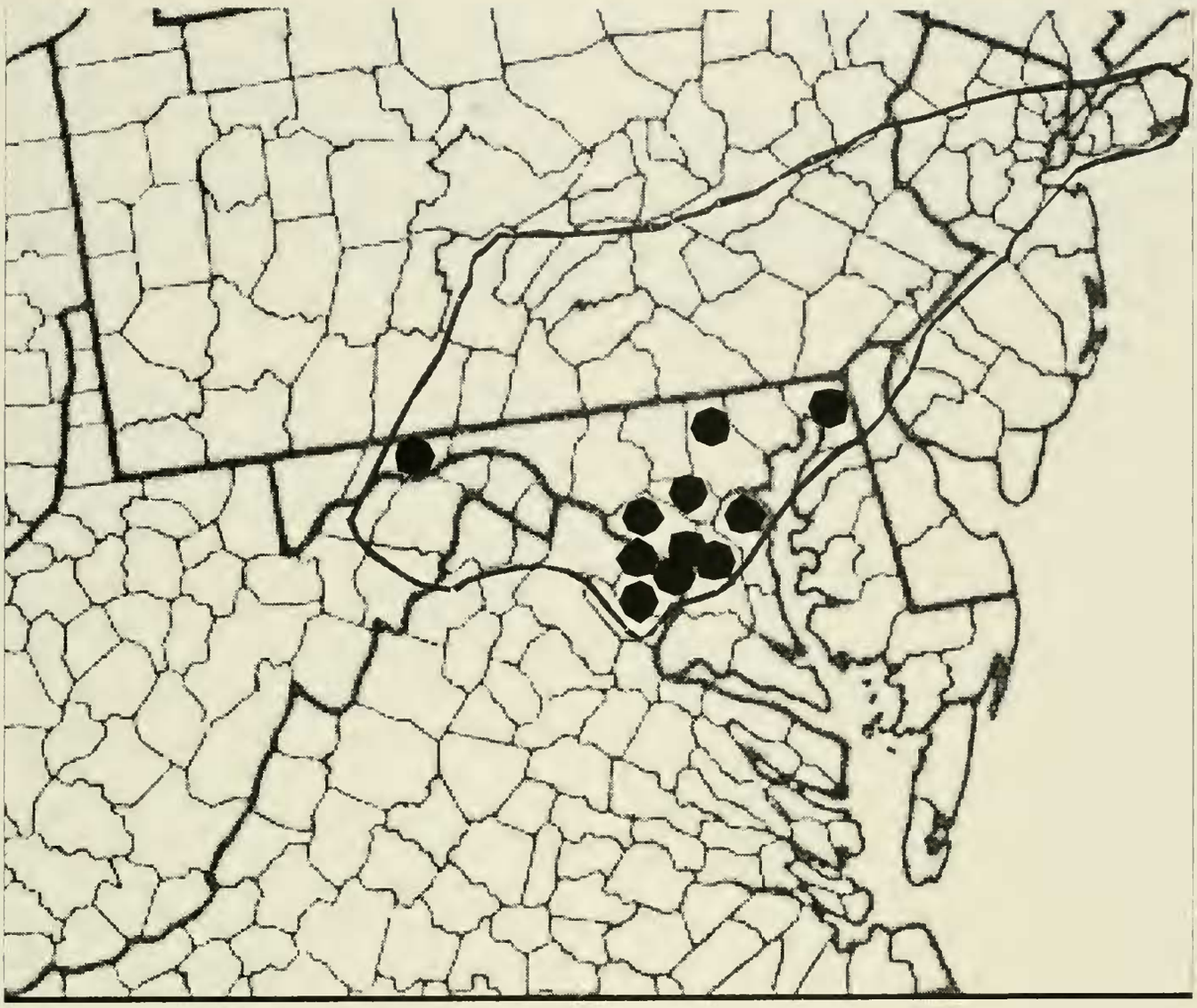

Fig. 1. Four-year accelerations reported in 2000 by county within the historic range of Brood X.

reports were received from Maryland (7 counties), and 28 were recorded from Virginia (4 counties). No reports were obtained from outside the known historic area of Brood X. All the reported 2000 sightings were of sporadic occurrences and although they may have contained dense local emergences of periodical cicadas, they were not the wide-ranging, regional emergences typical of these species.

An entomologist residing in Bowie, Prince George's County, Maryland, recorded the daily numbers of periodical cicada exuviae collected in her yard. She reported that mud turrets began to appear on May 4. On May 9, 62 nymphs were found walking around from 10 pm to midnight. Almost 3,000 (2902) exuviae were collected from the period May 8th to June 1st, 2000. However, throughout the remainder of the neighborhood, most yards had no periodical cicadas emerging at all. This same neighborhood was the site of an abundant emergence of Brood X in 1987. There are similar reports throughout the 2000 emergence area.

The following reported emergences of periodical cicadas in 2000. DISTRICT OF COLUMBIA: Georgetown, Northwest. VIRGINIA: Alexandria, Arlington, Fairfax, and Prince William counties. MARYLAND: Allegany, Anne Arundel, Baltimore, Cecil, Howard, Montgomery, and Prince George's counties.

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